CLAIMS

What is claimed is:

1. A method comprising:

   depositing a free layer structure;

   depositing at least one spacer layer;

   depositing a self-pinned pinned layer structure, wherein depositing a pinned layer structure comprises:

   depositing a first portion of a Reference layer in a DC aligning field having a first polarity;

   depositing a second portion of the Reference layer in a DC aligning field having a second polarity;

   depositing a first portion of a Keeper layer in a DC aligning field having third polarity; and

   depositing a second portion of the Keeper layer in a DC aligning field having a fourth polarity.

2. The method of Claim 1, wherein the first polarity is opposite the second polarity and the third polarity is opposite the fourth polarity.

3. The method of Claim 1, wherein the first polarity is the same as the third polarity and the second polarity is the same as the fourth polarity.

4. The method of Claim 1, wherein depositing a self-pinned pinned layer structure further comprises depositing at least one coupling layer between the second portion of the Reference layer and the first portion of the Keeper layer.

5. The method of Claim 1, wherein the free layer and the spacer layer are deposited before the self-pinned pinned layer structure.

6. The method of Claim 1, wherein the first portion of the Reference layer is the first half of the Reference layer and the second portion of the Reference layer is the second half of the Reference layer.

7. The method of Claim 1, wherein the first portion of the Keeper layer is the first half of the Keeper layer and the second portion of the Keeper layer is the second half of the Keeper layer.

8. An apparatus comprising a spin valve sensor, the spin valve sensor comprising:

a free layer structure;

a spacer layer adjacent to the free layer structure;

a self-pinned pinned layer structure adjacent to the spacer layer, pinned layer structure comprising:

a Reference layer having a first portion deposited with a first DC aligning field with one of a positive and a negative polarity and a second portion deposited with a second DC aligning field with an opposite polarity of the first DC aligning field;

a coupling layer adjacent to the Reference layer; and

a Keeper layer adjacent to the coupling layer, the Keeper layer having a first portion deposited with a third DC aligning field with one of a positive and negative polarity and a second portion deposited with a fourth DC aligning field with an opposite polarity to the third DC aligning field.

9. The apparatus of Claim 8, wherein the first portion of the Reference layer is the first half of the Reference layer and the second portion of the Reference layer is the second half of the Reference layer.

10. The apparatus of Claim 8, wherein the first portion of the Keeper layer is the first half of the Keeper layer and the second portion of the Keeper layer is the second half of the Keeper layer.

11. The apparatus of Claim 8, wherein the Reference layer is adjacent to the spacer layer.

12. The apparatus of Claim 8, wherein the apparatus is a magnetic head assembly.

13. A method of depositing a self-pinned pinned layer structure, the method comprising:

depositing a first half of a Reference layer in a first DC aligning field having one of a positive and negative polarity;

depositing a second half of the Reference layer in a second DC aligning field having a polarity that is opposite the polarity of the first DC aligning field;

depositing a first half of a Keeper layer in a third DC aligning field having one of a positive and negative polarity; and

depositing a second half of the Keeper layer in a fourth DC aligning field having a polarity that is opposite the polarity of the fourth DC aligning field.

14. The method of Claim 13, wherein the first DC aligning field and the third DC aligning field have the same polarity.

15. The method of Claim 13, further comprising depositing a coupling layer between the Reference layer and the Keeper layer.

16. The method of Claim 13, wherein the Reference layer is deposited before the Keeper layer.